GODDARD SPACE FLIGHT CENTER

Test Lab Report Summary

Report Number:	Q10153DPA	*Project:*	SWIFT
Part Type:	Microcircuit	*System:*	BAT
Part Number:	AD7888ARU	*Initiated Date:*	05/01/2001
Date Code:	9947	*Report Date:*	10/01/2001
Manufacturer:	Analog Devices, Inc.	*Investigator:*	C. Greenwell (562)
Generic Number:	AD7888	*Requester:*	B. Meinhold (562)
Purchase Spec:	Commercial	*Approval / Date:*	

Step 1: INCOMING INSPECTION

Test	Quantity	Passed	Failed
External Visual	N/A	N/A	N/A
PIND Condition A	N/A	N/A	N/A

Step 2: DESTRUCTIVE PHYSICAL ANALYSIS

Destructive Physical Analysis (DPA) was conducted per GSFC document "Plastic Encapsulated Microcircuit (PEM) Guidelines for Screening and Qualification for Space Applications", except that cross-section was done without dye penetrant and glassivation integrity testing was not performed.

No rejectable defects or anomalies were observed during this analysis.

18./19. Due to difficulty in deprocessing these devices, wire bond strength testing could not be performed on SN04. Also, only 10 of 19 wires in SN03 and 16 of 19 in SN05 could be tested. Of the wires tested in SN's 03 and 05 no failures were recorded and nearly all breaks were along the wire span and all well above the minimum specification level.

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Summary of Analysis:

Serial Number	01	02	03	04	05
External Examination					
1. Markings - legibility and correctness	A	A	A	A	A
2. Integrity of package seals	N/A	N/A	N/A	N/A	N/A
3. Condition of external leads and plating	A	A	A	A	A
4. Overall package condition	A	A	A	A	A
Radiographic Examination					
5. Die bonding material and die alignment	A	A	A	A	A
6. Package seal integrity	N/A	N/A	N/A	N/A	N/A
7. Presence of foreign material	A	A	A	A	A
8. Lead dress (if revealed)	A	A	A	A	A
Acoustic Microscopy Inspection					
9. Condition of material interfaces (delaminations)	A	A	A	A	A
10. Condition of molding material (voids, cracks)	A	A	A	A	A
Internal Examination (including cross-section)					
11. Presence of foreign material	A	A	A	A	A
12. Mechanical condition of die	A	A	A	A	A
13. Wire bonds and lead dress	N/P	N/P	A	A	A
14. Die bonding material	A	A	A	A	A
15. Condition of die surface	N/P	N/P	A	A	A
16. Condition of metallization	N/P	N/P	A	A	A
17. SEM Examination	A	A	A	A	A
Bond Strength					
18. Strength	N/P	N/P	A	N/P*	A
19. Metallization adherence	N/P	N/P	A	N/P*	A
Die Bond Strength					
20. Strength	N/P	N/P	N/P	N/P	N/P

SN's 01 and 02 subjected to cross-sectional examination.

(* = Refer to comments, A = acceptable, U = unacceptable, N/A = not applicable, N/P = not performed)

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Appended Photographs:

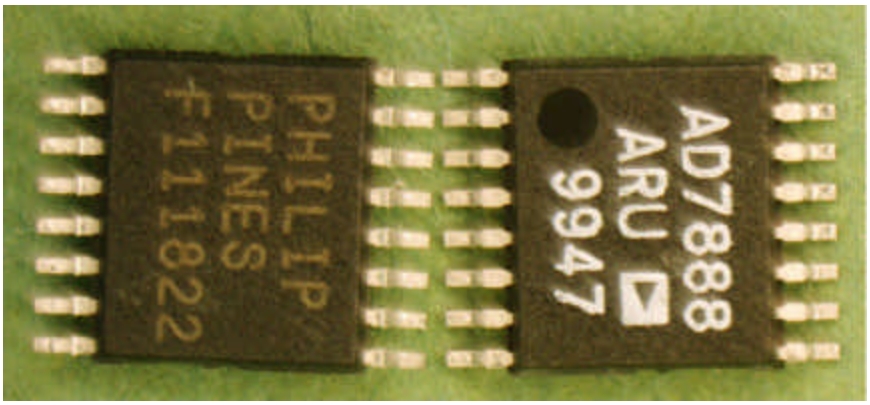

Figure 1. External top and bottom views of the AD7888ARU devices. 8X

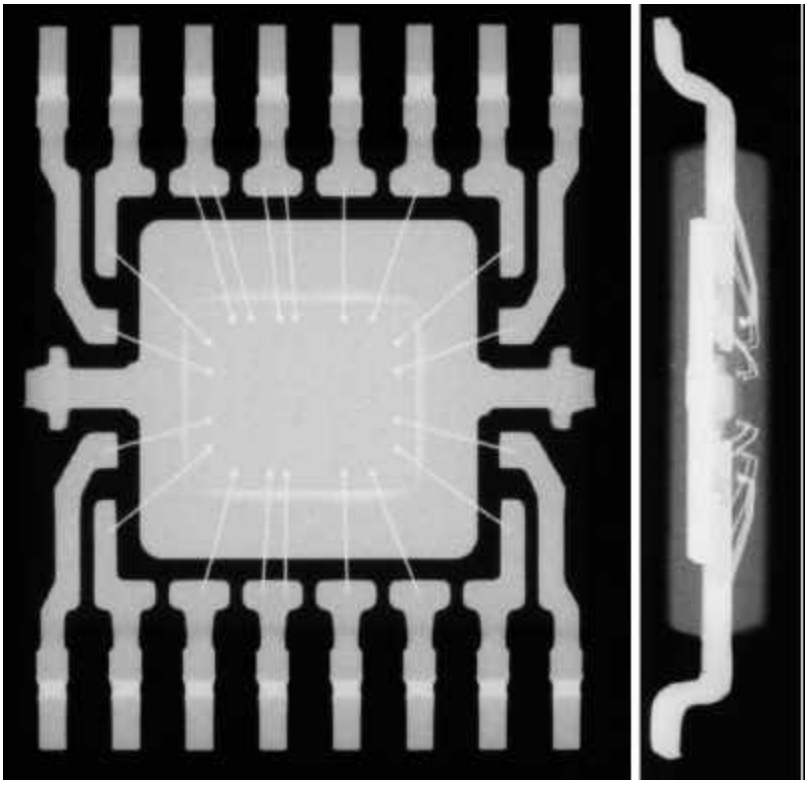

Figure 2. Top and side view radiographic images. 14X

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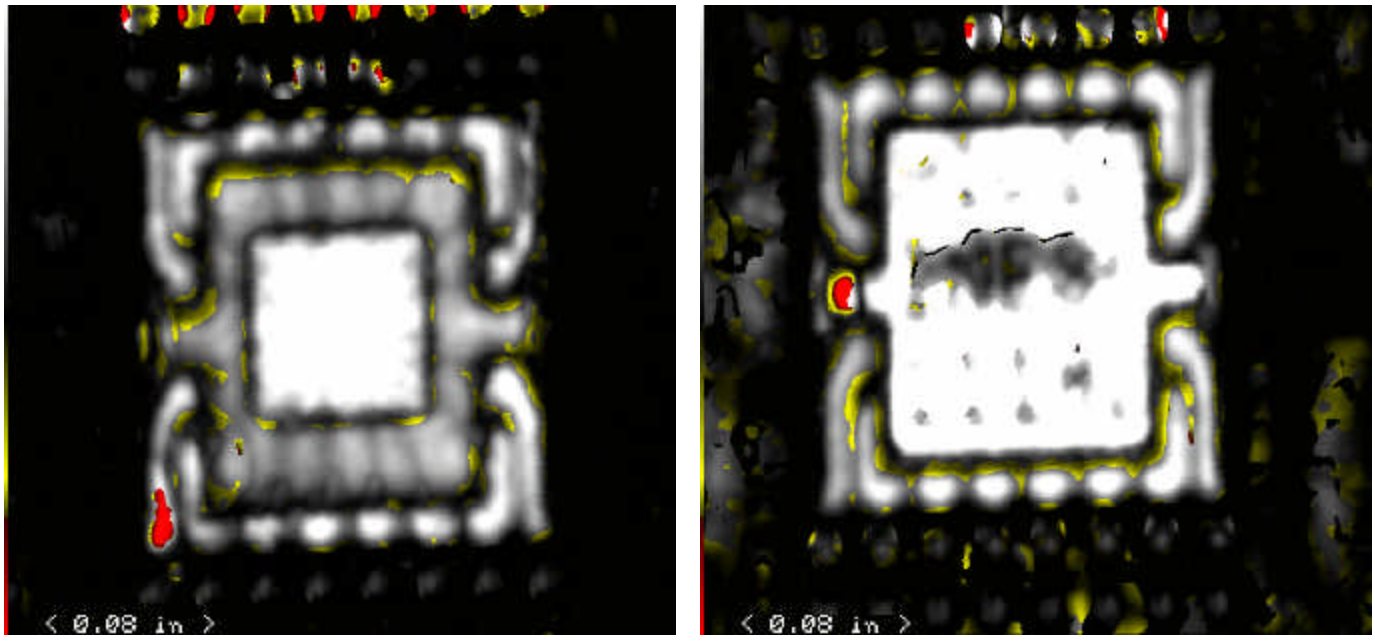

Figure 3. Top (left) and bottom C-SAM images of SN 01. The SN markings applied in the lab for tracking purposes produce visible artifact in the bottom view images. These are not defects with the devices.

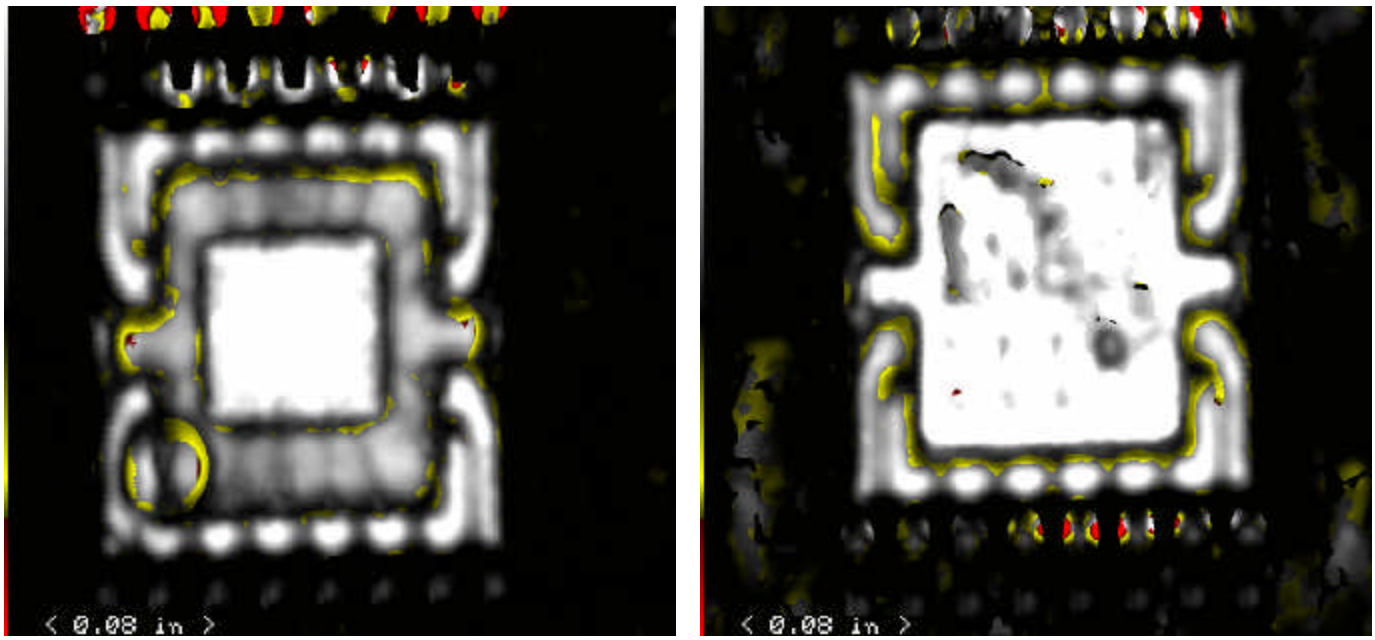

Figure 4. Top (left) and bottom C-SAM images of SN 02.

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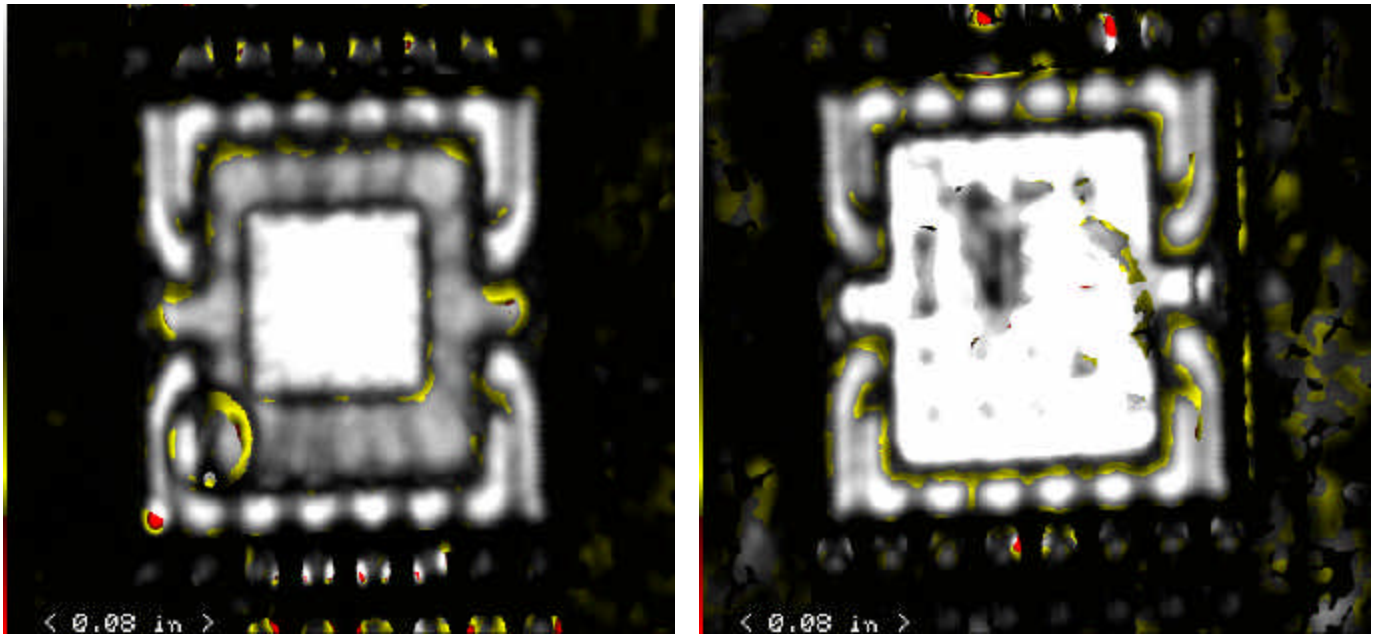

Figure 5. Top (left) and bottom C-SAM images of SN 03.

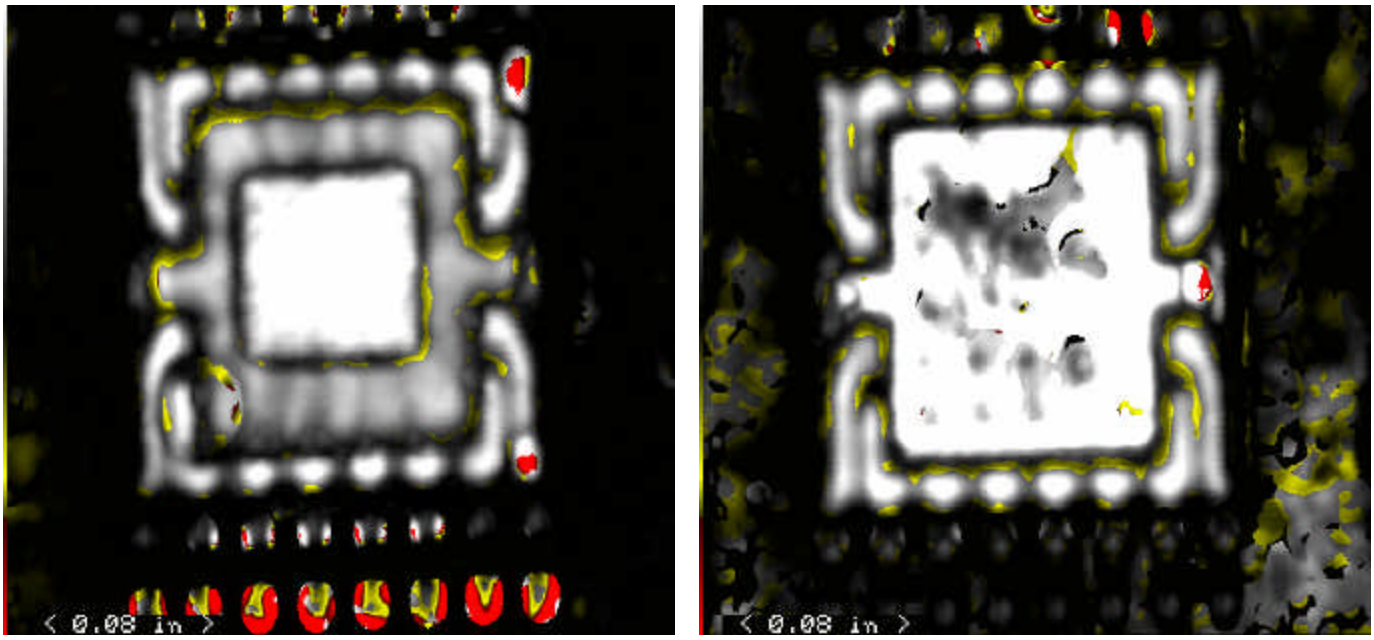

Figure 6. Top (left) and bottom C-SAM images of SN 04.

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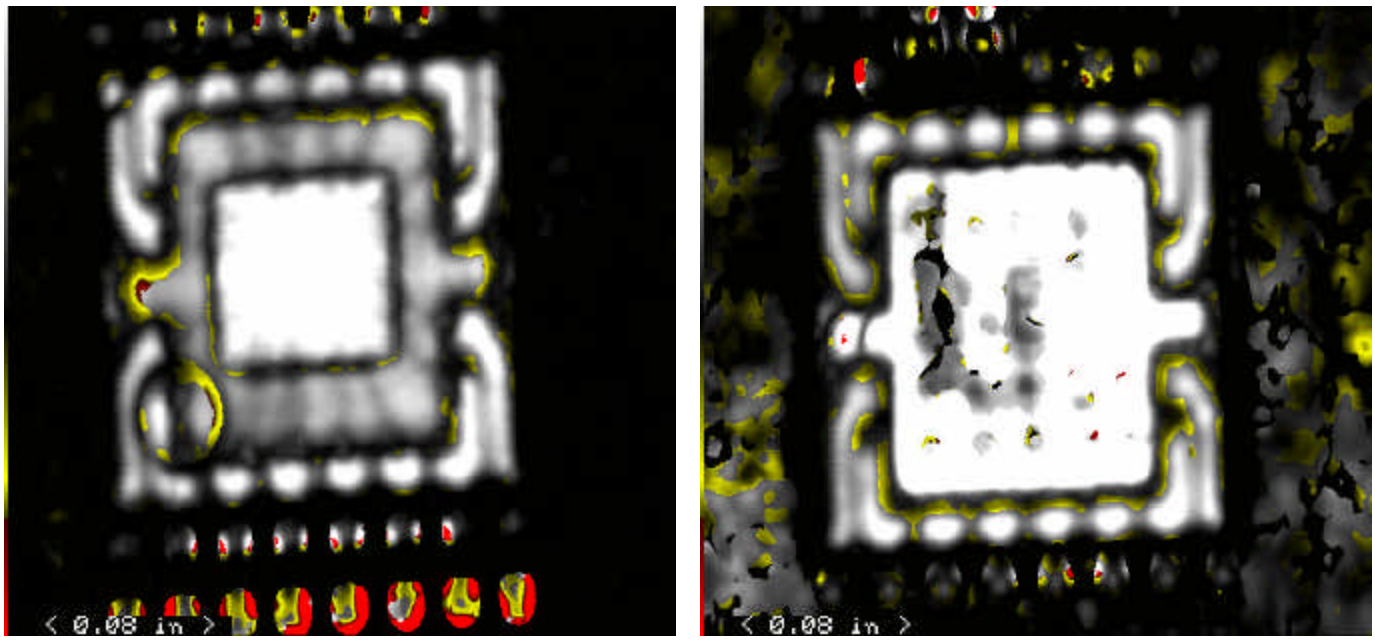

Figure 7. Top (left) and bottom C-SAM images of SN 05.

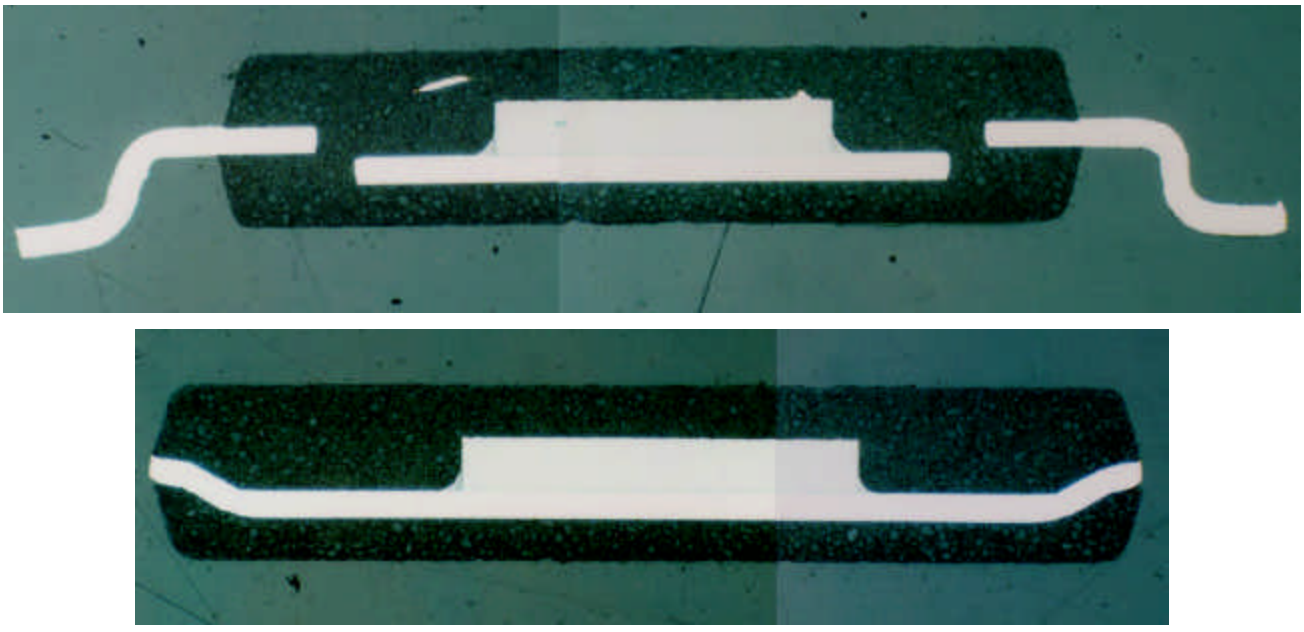

Figure 8. Cross-section images of SN 01 (top) and SN 02. Both images - 26X

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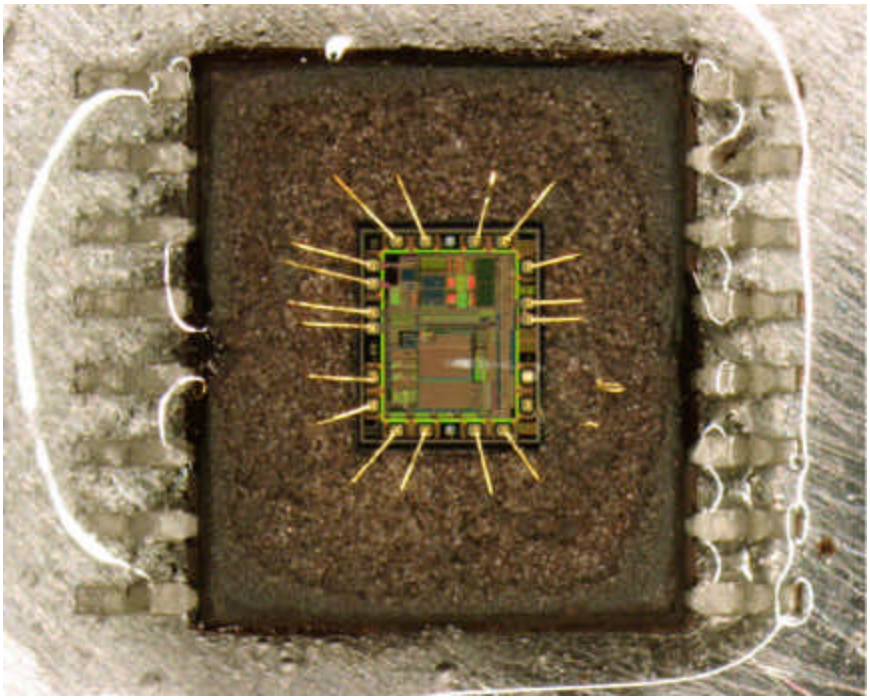

Figure 9. Overall optical image of SN05 after deprocessing for internal examination.

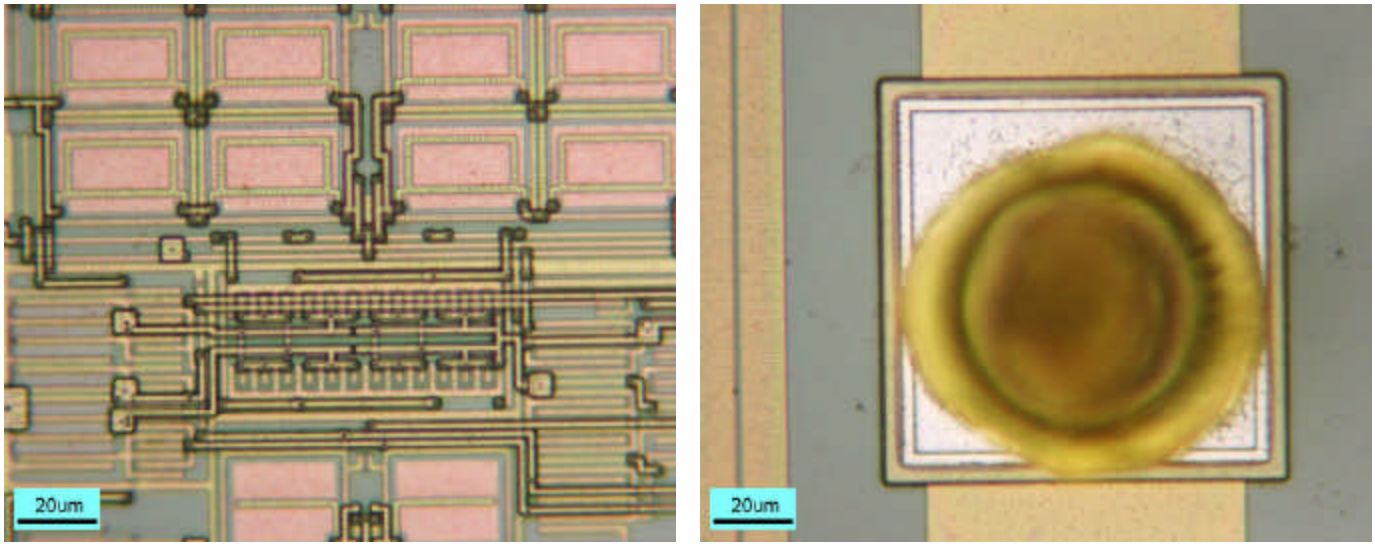

Figure 10. High magnification optical images show typical features on SN03 die.

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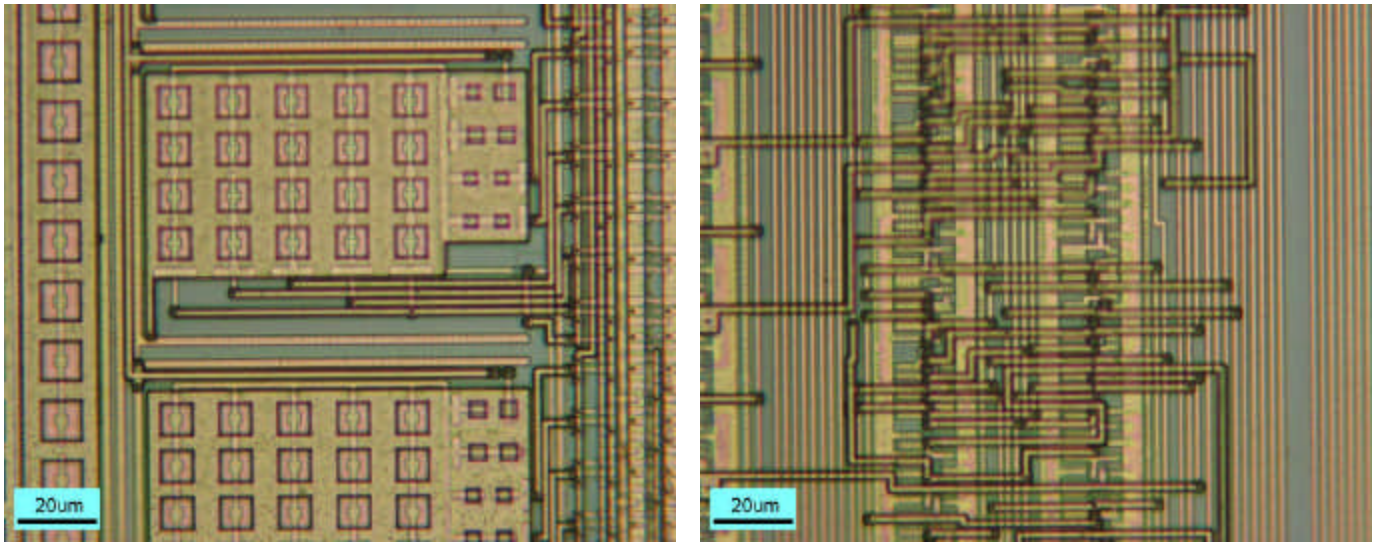

Figure 11. Optical micrograph images show typical features on SN 04 die.

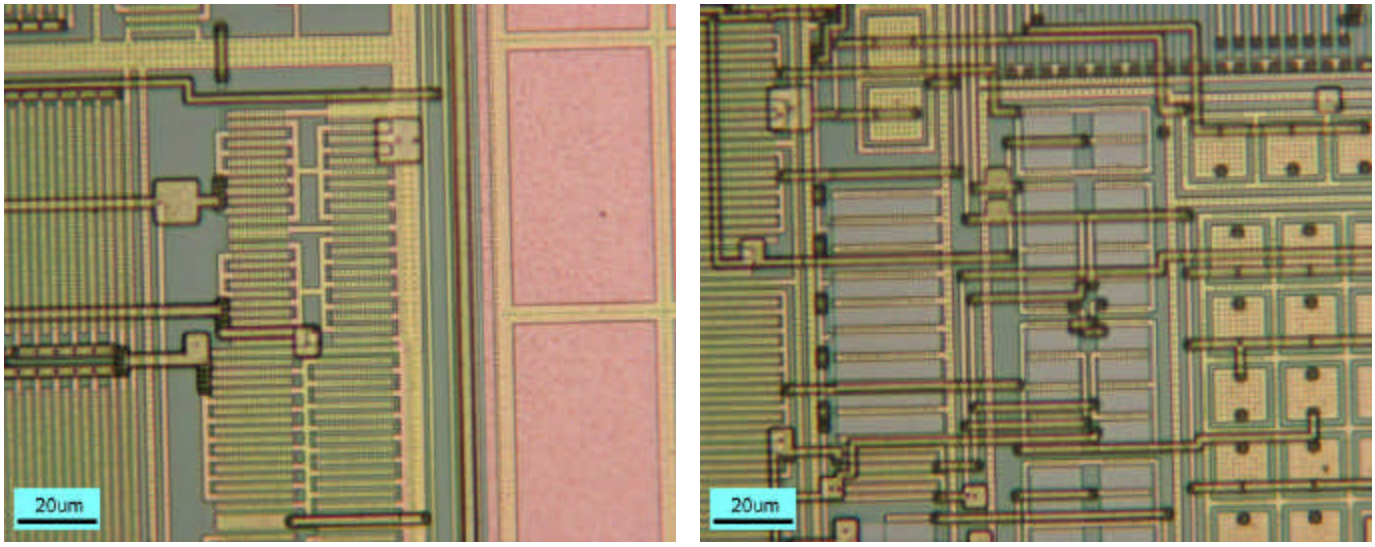

Figure 12. Optical micrograph images of SN 05.

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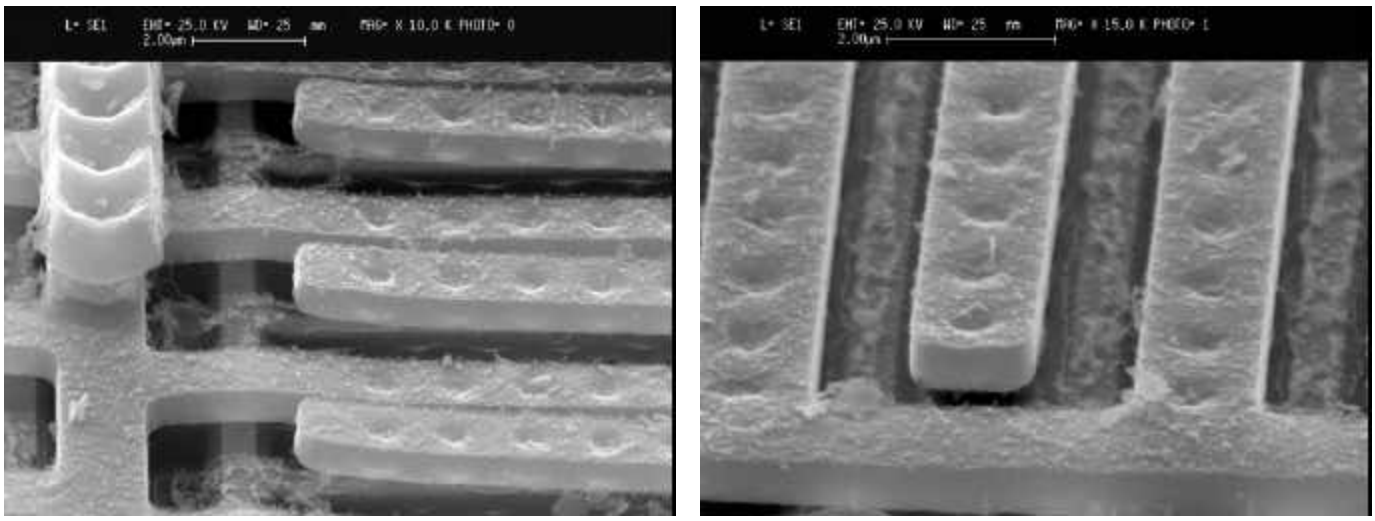

Figure 13. SEM micrographs of SN05 show general metal features.

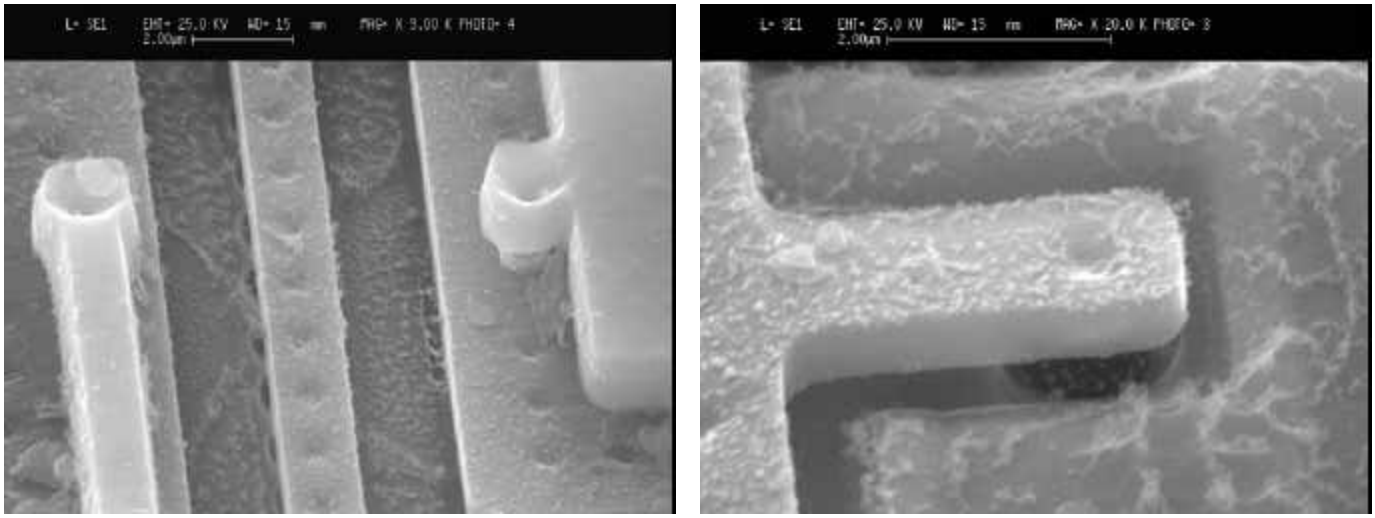

Figure 14. SEM micrographs of SN03 show general metal features.